EPAct/V2/E-89: Assessing the Effect of Five Gasoline Properties on Exhaust Emissions from Light-Duty Vehicles Certified to Tier 2 Standards

Final Report on Program Design and Data Collection

Appendix C
Fuel Round Robin Procedure for Sample Handling

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

National Renewable Energy Laboratory
U.S. Department of Energy

Coordinating Research Council

NOTICE

This technical report does not necessarily represent final EPA decisions or positions. It is intended to present technical analysis of issues using data that are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments.

United States Environmental Protection Agency

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EPAct/V2/E-89 Fuel Round Robin
Procedure* for Sampling and Handling of Gasoline Samples

1) Take samples from designated full drums only.

2) Equipment Selection:
   a. Hand operated transfer pump.
   b. 1-quart plastic-coated, amber colored glass bottles w/Teflon lined seals. Such bottles are available from e.g. All-Pak, Inc. (Bridgeville, PA, Contact: Paul Molloy 800/413-8867). Their Stock Number is GLC-02270.
   c. 1-oz. amber colored glass bottles w/Teflon lined seals. Such bottles are available from e.g. All-Pak, Inc. (Bridgeville, PA, Contact: Paul Molloy 800/413-8867). Their Stock Number is GLC-01897.
   d. Torque adapter for tightening sample bottle caps using a torque wrench. Such an adapter is available from All-Pak, Inc. (Bridgeville, PA, Contact: Paul Molloy 800/413-8867). Its Stock Number is HMS-1015C.
   e. Torque wrench with ¼" drive to secure bottle caps. Must cover 12 - 18 in*lbs range.
   f. Waste or slop container for flushing.
   g. Sample labels.

3) Preparation Process:
   a. Mark 80% capacity level on each sample container to be filled.
   b. Pre-cool the fuel inside the drum, sampling equipment, and sample containers to a temperature not exceeding 50°F.
   c. Insert hand pump into drum opening, with supply line inlet at mid-height of the drum.
   d. Flush ~ 1 quart of the fuel into slop container.
      - If the transfer pump is removed from the main drum for any reason, once reinserted a new flush is to be performed.

* This procedure does not purport to cover any safety aspects associated with sampling of fuels. EPA presumes that the personnel performing sampling operations are adequately trained with regard to safe application of the procedures contained herein.

4) Sampling Process:
    a. Rinse each sample container with the fuel it will be filled with and allow the container to drain.
    b. Fill each container to 75-80% of capacity.
        - Make sure that during the filling process the fuel flows gently (w/o splashing) into the container. Use a filling tube which reaches to the bottom of the container.
    c. After each filling, immediately secure the cap onto sample container and tighten using a torque wrench. Apply the following torques:
        - 1-qt glass bottle: 18 in*lbs.
        - 1-oz. glass bottle: 12 in*lbs.
    d. Wrap cap and neck of each sample bottle with back-off tape (Make sure the back-off tape is provided with the shipping kit).
    e. Attach sample label for proper identification.
        - Sample labels must, at a minimum, contain the following information: Name of program (EPAct/V2/E89 Program) and the round robin fuel designation, e.g. B3.

5) Storage Prior to Shipping:
    - Store samples at max. 75°F prior to shipping. Transfer samples to cool storage if shipping is delayed by more than 5 days.

6) Tracking of Fuel Shipments:
    - SWRI shall notify EPA, DOE and round robin participants via email about the shipment of fuel samples and request the participants, in turn, to notify SWRI, EPA and DOE about the receipt of the samples.

Note: For additional guidance refer to ASTM D5842 Standard Practice for Sampling and Handling of Fuels for Volatility Measurements and ASTM D4057 Standard Practice for Manual Sampling of Petroleum and Petroleum Products.